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SECTOR 6 — CHART INFORMATION

SECTOR 6

CHINA—HANGZHOU WAN AND APPROACHES

Plan.—This sector describes the E coast of China between Nanhui Zui, the N entrance point of Hangzhou Wan, and T'ung-t'ou Shan, an islet about 98 miles to the S, and includes off-lying islands and Hsiang-shan Chiang. The description is N to S.

General Remarks

6.1 Winds—Weather.—Monsoon conditions prevail. The Northeast Monsoon season (September-March) has winds that blow as moderate breezes from NW through N to NE about 70 per cent of the time. The Southwest Monsoon season (June-July) has irregular winds blowing from S to SW. September is the wettest month with July being the driest.

Tides—Currents.—Ocean currents come largely under the influence of monsoon winds. September through April, currents set to the S. From about May through August they set N. Currents in Hangzhou Wan generally set seaward.

Hangzhou Wan (Hangchow Bay) (30°25'N., 121°00'E.) is a large shoal bay whose shores are fronted by an extensive margin of drying mud flats. The N shore is low and flat and lies on the S limit of a vast, cultivated plain which extends well inland from the N part of the E coast of China.

The S shore continues low and flat for a short distance inland, then rises to hills and mountains which, trending NE in parallel ridges, reach the coast at the S entrance point of the bay in an elongated, bold promontory and then continue seaward to form an archipelago of characteristically scattered off-lying islands.

The near shore is level and has extensive areas of drying mud flats. The numerous off-lying islands rise steeply from surrounding shoal water which extends well offshore.

Ports of interest to shipping are **Dinghai** (30°01'N., 122°06'E.), **Zhenhai** (29°57'N., 121°43'E.), and **Ningbo** (29°53'N., 121°33'E.), located in the general area around the S entrance point of Hangzhou Wan.

An inside passage for moderate-size vessels of suitable draft leads between the mainland and off-lying islands. Vessels, having arrived W of Fodu Dao enter Fo-to-kang-tao, and proceeding through Luotou Shuidao and Cezi Shuidao transit either E or W of Cezi Shan.

A vessel then passes W of Wushi, then steers through the channel E of Yuxing Nao. After passing E or W of Qiqi Qundao, vessels proceed to Daji Shan.

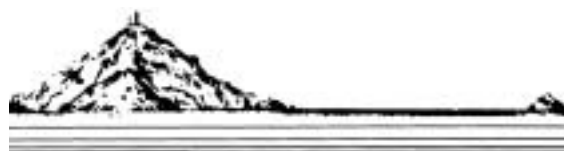
Hangzhou Wan—North Side

6.2 Nanhui Zui (30°53'N., 121°53'E.), the N entrance point of Hangzhou Wan, is low and reported extending seaward. A low embankment extends irregularly to the W.

Daji Shan (Ta-ch'i Shan) (30°49'N., 122°10'E.), about 16 miles ESE of Nanhui Zui, is an isolated islet rising to a height of about 79m from surrounding shoal water and adjacent rocks. The island is covered with vegetation and appears cone-shaped

from the NE. Rocks extend 0.2 mile from its W, S, and E sides; those on the E side end in a prominent 3m high black rock. A signal station can be contacted by means of the International Code of Signals. Vessels anchor, in 11m, about 0.4 mile off the W side of the islet, and clear of the many submarine cables in the area, with a lighthouse bearing 064°, and just open S of a white hut on the SW side of the islet. A light is shown on the summit of Daji Shan.

Caution.—Numerous dangerous wrecks, best seen on the chart, lie from N through SW of Daji Shan.



Daji Shan Light bearing 248°

6.3 The coastline between Nanhui Zui and the metropolis of Hangzhou (Hangchow), about 97 miles WSW, is fronted by drying mud flats and several islets, and backed by low-lying land interrupted by hilly promontories of Ch'eng Shan and Chin Shan, about 43 miles and 55 miles, respectively, WSW of Nanhui Zui. Cha-p'u, a community close W of Ch'eng Shan, is the former seaport of Hangzhou. Chiu-wang-wei Shan, a small islet close E of Chin Shan, is the head of navigation for ocean vessels.

Jianshan Tanker Terminal (30°43'N., 121°20'E.) has two berths that can accommodate tankers with a draft of 6.5m. Pilots board in position 30°38'N., 121°20.3'E.

Tanker terminals serve the Shanghai Petrochemical Plant. One tanker pier accommodates vessels up to 25,000 dwt with crude oil. Three recently completed berths take 5,000 dwt class ships and are designed to handle chemical products. Two are 126m long, with depths alongside of 8.6m and 9m respectively, and the other is 76m long, with a depth of 5.2m.

Plans are in progress to build a number of 10,000 dwt general cargo berths to ease congestion at Shanghai.

There are no facilities currently reported to be available at these terminals.

Zhapu (Chapu), the former port of Hangzhou has undergone a major change with construction of deep water, offshore berths for vessels of 1,000 dwt and 10,000 dwt. These offshore berths are connected to the shore by a pier 1,134m in length. The port has 24 berths of various types.

Facilities have been developed to accommodate vessels 30,000 to 50,000 dwt.

Qiantang Jiang (Ch'ien-t'ang Chiang), a narrow estuary largely dry at low water, winds WSW from Chin-wang-wei Shan for a distance of about 42 miles to Hangzhou.

Small vessels, with a draft not greater than 0.9m, can proceed through Qiantang Jiang to Hangzhou.

Pilotage.—Pilot is compulsory pilots board at Luhuaashan anchorage during daylight hours.

Caution.—A tidal bore exists in Qiantang Jiang. It begins near the time of low water about 12 miles WSW of Chiu-wang-wei Shan and advances as far as Hangzhou at a rate of 12 to 15 knots. A Hai-ning, a community about 23 miles upstream from Chiu-wang-wei Shan, the bore appears as a wall of water a mile wide and may reach a height of 0.6m at neaps and 3.4m at springs. All navigation between Hai-ning and Hangzhou begins after the bore has passed and ends 2 hours after high water, a period of 2 to 4 hours.

The extreme tidal range reaches about 8.5m in Hangzhou Wan. At Hai-ning, the mean range is 4.7m and the spring range is 5.8m.

Hangzhou Wan—North Approach—Off-lying Islands and Deep Water Channels

6.4 The islands in the N approaches to Hangzhou Wan are grouped N and S of Huang-tse Yang, an intervening deep water channel. The N islands consist of three groups: Ma-an Liedao, Sijiao Shan and its adjacent islands, and Qiqu Qundao (Ch'i-ch'u Lieh-to). The S group consists of Daqu Shan and adjacent islets.

Hai Jiao (Tung Tao) (Barren Islands) (30°44'N., 123°09'E.), about 66 miles E of Nanhui Zui, consists of a group of several islets and rocks which constitute the farthest seaward danger in the N approaches to the bay. The W and highest islet is reported radar conspicuous at 16 miles. A light is shown from the W islet of Hai Jiao, and a racon transmits from it.

Foul ground extends 0.6 mile SE of the E islet, with a drying 3m high rock, on which the sea breaks heavily, on the extremity of the foul ground. An obstruction, with a depth of 8.6m, lies 1 mile N of Hai Jiao.

Caution.—An explosives dumping area, 2 miles square, is centered 3 miles WNW of Hai Jiao.

6.5 Ma-an Liedao (30°44'N., 122°45'E.), the E group of islands N of Huang-tse Yang, extends about 15 miles NW-SE and consists of several larger islands with numerous islets, isolated rocks, and smaller islands scattered among them. The larger islands are inhabited.

Huaniao Shan (30°51'N., 122°41'E.), the N of the larger islands, is grass-covered and characteristically steep-sided, bold, and rugged. It rises to a saddle shaped summit, 236m high, and is reported to be radar conspicuous at 20 miles. A light is shown on the N extremity of Huaniao Shan. Tide rips form on the E side of the island.

Anchorage.—Vessels usually anchor in moderate depths in a bay on the N side of the island, but must clear for sea with short notice during spring and late fall, when N winds set in without much advance warning. Anchorage in a bay on the SE side of the island is subject to a heavy swell when winds blow from S through E to NNE. Tidal currents are strong.

Luhua Shan (30°49'N., 122°38'E.), about 2 miles SW of Huaniao Shan, consists of Dongluhuashan and Xiluhuashan, two rugged precipitous islands joined together by a rocky ledge.

Anchorage.—Luhuaashan Maodi is a designated anchorage, 2 miles wide and extends between 1 mile and 4 miles S of

Xiluhuashan. It is used for lightening vessels before proceeding up Chang Jiang. The anchorage has thick mud seabed with good holding ground.

The anchorage is sheltered from all winds except S and can be used for shelter on the approach of a typhoon. In strong S winds it is advisable to anchor to the N of Xiluhuashan. A clear approach to the anchorage can be made from the NE. The anchorage is under the jurisdiction of the Fagang Harbor-master. Areas of the anchorage are subject to strong tidal currents, particularly the center, with the strongest being during the ebb. The anchorage is also used for the transshipment of LPG. LPG vessels are not permitted to anchor within 1.1 miles of the transshipment bulk carrier.

Caution.—Care must be taken to avoid the submarine cable lying 2 miles N and NW of Huaniao Shan.

6.6 Yemaodong (30°48'N., 122°47'E.), lying about 6 miles SE of Huaniao Shan, has a saddle shaped summit, 158m high. A chain of islets and rocks extends 2 miles NW and 1 mile SE of the island. In strong winds, there are heavy tide rips off the end of the SE chain.

Anchorage.—Anchorage can be taken in 7.4 to 11m, mud, sheltered from winds between E and NW, in the bay on the S side of Yemaodong.

Chengian Shan (30°44'N., 122°49'E.), about 3 miles SSE of Yemaodong, is the SE island of Ma'an Liedao. The coast is rocky and precipitous, and its highest peak, 211m high, lies in the middle of the island. Gouqi Shan, close W, has a double summit, 197m high, in its N part that is considerably higher than the rest of the island.

Tides—Currents.—Tidal currents reach a velocity of 3 knots at springs, but their effect is lessened the farther within the anchorage. During spring tides, the current is strong enough to swing a vessel against a moderate breeze.

Anchorage.—Between the SW side of Chengian Shan and the SE side of Gouqi Shan, anchorage, sheltered from winds E through N to W, can be obtained. The approach to the anchorage is made from the SW by keeping the center of a prominent beach in range, bearing 032°, with a prominent boulder at an elevation of 206m about 0.4 mile from the highest peak on Chengian Shan. Vessels anchor, in 12.8 to 18.2m, stiff mud, in the E part of the anchorage where the bottom is free of known dangers and shelves gradually shore-ward.

6.7 Sijiao Shan (Shengsi Liedao) (30°42'N., 122°30'E.), the middle group of islands N of Huang-tse Yang, consists of a larger island with smaller islands and clustered islets scattered in a general SW direction for a distance of about 10 miles.

Sijiao Shan, the largest island in the group, is rugged, steep-sided, and has a very irregular shoreline which for the greater part rises precipitously from the surrounding shoal water; the island has many peaks, the highest of which, 217m high, stands at its SW end. A sandy beach within a bay on the E side of the island is conspicuous and one of the few features visible during periods of misty weather.

Anchorage.—Anchorage can be obtained all around the island, except on the S side.

Caution.—Tide rips form off the NE point of the island and also off the S side of an islet lying 1 mile further NW. A wreck

dangerous to navigation reported (2000) in position 30°40.9'N, 122°22.9'E, 3.5 miles N of Banyang Jiao Light.

6.8 Baijie Shan (30°37'N., 122°25'E.), about 5 miles S of the SW extremity of Sijiao Shan, is a rugged precipitous island surrounded by islets and shoal water. Vessels anchor, in 11 to 16.4m, sheltered from NW winds, off the S extremity of the island and in similar depths, sheltered from N and NE winds, off the W side, with the light on the S extremity of the island bearing 132°, 0.2 to 0.4 mile distant. Tidal eddies are troublesome.

Chuanhu Liedao (30°36'N., 122°20'E.), close WSW of Baijie Shan, is a group of steep-sided smaller islands and islets largely joined by an area of shoal water. Vessels anchor, in 18.2m, sheltered from typhoon winds, with the summit of Shangchuan Shan, the W island of the group, bearing 357°, and Bitou Jiao, an isolated precipitous rock W of the group, bearing 275°. Care must be taken to avoid Webb Rock (Weipei Shih), a pinnacle rock with a depth of 2.1m lying on the W side of the anchorage. There is no indication of this rock except when tide rips occur during calm weather. Currents are troublesome but no swell is felt.

Baijie Xia (30°36'N., 122°25'E.), the 2 mile wide channel between Baijie Shan and the several islets NE of Chuanhu Liedao, is the passage most commonly used by vessels bound to and from the entrance to the river Chang Jiang. Vessels steer through the channel on a track defined by the light on Banyangshan, a black rocky islet lying 2 miles WNW of Baijie Shan, in line bearing 315°, with the light on Daji Shan. Tidal currents are strong and require a timely course change to N so as to pass at least 0.5 mile E of Banyangshan and the area close around the islet in which ship handling often becomes quite unmanageable.

Caution.—An anchorage and fishing prohibited area NNW of Baijie Shan can be best seen on chart.

6.9 Qiqu Qundao (Ch'i-ch'u Lieh-tao) (30°36'N., 122°05'E.), the W group of islands N of Huang-tse Yang, extends about 10 miles NW-SE and consists of some 30 islets clustered around and generally N of **Dayangshan** (30°35'N., 122°04'E.), the largest and highest islet of the group. Vessels anchor, in 7.3 to 11m, sand and mud, about 0.75 mile SE of the head of a bay on the SE side of Dayangshan. Huini Jiao, a pinnacle rock with a depth of 0.6m, lies in the SW approaches to the anchorage. It is safely cleared to port by approaching the anchorage from the SSE with the highest peak on Xiaoyang Shan, an island about 2 miles NNW, bearing 337° and just open E of the S entrance point of the bay.

Tangnao Shan (30°36'N., 121°58'E.), lying 4 miles W of Dayangshan and marked by a light on its summit, is the W island in this group. **Daqu Shan** (Ch'u Shan) (30°27'N., 122°20'E.) is the principal island among the several islands and islets scattered along the S side of Huang-tse Yang. It is hilly, rugged, and has a characteristically irregular coastline much indented by mud-filled bay, inlets, and small coves. A bay on the S side of the island has been reclaimed and given over to cultivation by a considerable population inhabiting the W and N parts of the island. Vessels anchor in convenient depths, mud and sand, W of the conspicuous peninsula extending N from the central part of the N coast.

Anchorage.—Anchorage is sheltered by off-lying islands and is a safe refuge during typhoons. Anchorage off the SW extremity of the island is troubled by tidal currents which attain a velocity of 5 to 6 knots at springs.

Sanxing Liedao (30°26'N., 122°31'E.) is a group of islands and islets extending 5 miles E of Daqu Shan. Good anchorage, sheltered from E through N to NW, can be obtained, in depths of 9.1 to 12.8m, with the W extremity of Shulanghu, the W and largest island of the group, bearing 334°, distant 0.75 mile. Anchorage can also be obtained SE of Xiaoshulang, in depths of 9.1 to 11m. A light is shown from the summit of Xiaoshulang.

Langgang Shan (30°26'N., 122°55'E.), a small group of three barren rocks, lie about 26 miles E of the E side of Daqu Shan and constitute the farthest seaward danger on the S side of Huang-tse Yang. They are reported radar conspicuous at 12 miles. The group is marked by a light.

Fengchao Yen (Wu Chiao) (30°22'N., 122°41'E.), 15 miles WSW of Langgang Shan and marked by a light, is a black rugged rock 14m high; a flat-topped rock, which dries 2m, lies 0.15 mile SE. A pinnacle rock, with a depth of 2.7m, lies 0.4 mile NNW.

Hangzhou Wan—Central Approach—Off-lying Islands and Deep Water Channels

6.10 The islands in the central approaches to Hangzhou Wan are separated from those in the N approaches by the clear channel Ch'u Chiang and are grouped N and S of Huang-ta Yang, an intervening deep water channel somewhat restricted in its W part before it gains access to the bay under the name of Huipieh Yang.

The N islands consist of Zhongjieshan Qundao, Changtushan, and Dai Shan, as well as numerous intervening and adjacent islands, scattered islets and isolated rocks. The S group consists of the N and NE coasts of Zhoushan Dao and the off-lying islands N of **Cambria Point** (Ta-peng Chiao) (29°50'N., 122°25'E.).

Zhoushan Qundao, an angle-shaped archipelago consisting of a multitude of islands, islets, and scattered dangers to navigation, lies off the S entrance point of Hangzhou Wan, between the parallels 30°20'N and 29°38'N and the meridians 122°46'E and 121°50'E. The islands on the N side of Huangta Yang constitute the N part of the archipelago. The islands on the S side of the channel lie in the S part of the archipelago.

Zhongjieshan Qundao (30°11'N., 122°40'E.), the E main group of islands N of Huang-ta Yang, consists of four hilly islands and there are numerous adjacent islets and rocks.

Anchorage.—Anchorage for one vessel can be obtained in a depth of 18.3m, mud, with the summit of Xifu Shan, the SE island of the group, bearing 147°, distant 0.5 mile. Vessels also anchor, in 11 to 12.8m, mud, in the entrance to a bay on the SW side of Miaozihu Dao, the central island of the group. A rock, drying 3.7m and steep-to, lies in the middle of the bay; other rocks extend N from it to the shore.

Caution.—A dangerous wreck reported (2000), lies 3 miles WNW of Waimati Jiao.

6.11 Dongfu Shan (30°08'N., 122°46'E.), about 3 miles SE of Xifu Shan, is a high, steep-sided island, reported radar con-

spicuous at 21 miles, is an excellent landmark from the S. A dome-shaped white patch on the N side of the island is a good mark. Vessels approach the anchorage on the SW side of the island by steering for the island's summit on a heading of 057° and come to anchor, in 23.7 to 31m, sheltered from N and E winds, when the summit of **Qingbin Dao** (30°12'N., 122°42'E.) bears 327°.

Liangxiongdi Dao (30°10'N., 122°57'E.), consisting of two islets, 25m high, lies about 9 miles ENE of Dongfu Shan, and is the farthest seaward danger on the N side of Huang-ta Yang.

Sizimei Dao (30°10'N., 122°52'E.), 3 miles W of Liangxiongdi Dao, consists of a group of four islets 24m high; a rock, with a depth of 4.3m, lies 0.8 mile S of them. Other dangers may best be seen on the chart.

Hsiao-pan Men (Xiaoban Men) (30°12'N., 122°36'E.), the deep and clear body of water between Huangxing Dao and two islets about 2 miles to the W, is the passage most commonly used by deep-drafted vessels seeking to transit the many scattered islets between Zhongjieshan Qundao and Daxizhai Dao. The passages W of Daxizhai Dao are not recommended because of numerous dangers and strong tidal currents.

Daxizhai Dao (30°14'N., 122°29'E.) is a 185m high, saddle-shaped island lying about 8 miles W of Zhongjieshan Qundao.

Anchorage.—Anchorage sheltered from N and E winds, can be obtained 0.5 mile off the SE side of the island, in a depth of 18.3m, soft mud. Vessels also anchor, in 18 to 26m, mud, seaward of a small inlet on the N side of the island.

6.12 Changtushan (30°15'N., 122°20'E.), the middle main group of islands N of Huang-ta Yang, consists of two rugged and largely mountainous islands whose coastline is indented by numerous bays, coves, and inlets the greater number of which are fronted by drying mud flats. Xiachangtu Shan, the W island, and Dachangtu Shan, the E island, are separated by Changtu Gang, a narrow, land-locked channel which provides a good anchorage and typhoon refuge. There is room for several medium size vessels, in depths of 9.1 to 23.8m.

Under ordinary conditions, little swell sets into **Changtu Gang** (30°15'N., 122°17'E.), but during typhoons a swell from the E rounds the SW extremity of Dachangtu Shan and breaks on a drying mud flat on the S side of the W entrance to the channel. Tidal currents set in the axis of the channel and reach a velocity of 5 knots in the W entrance. Small vessels drawing 4.9m enter the channel from either entrance at any stage of the tide.

Larger vessels, over 61m long and drawing not more than 7.3m, use the W entrance at slack water, in preference to the E entrance where a sharp turn and strong currents make ship handling difficult. Vessels anchor in the middle part of the channel where the drying mud flats extending offshore are steep-to. Vessels sheltering from a typhoon keep one anchor upstream and one downstream and ride with 75 to 90m of chain on each anchor as the currents may cause single anchors to foul.

Chu-hsu Chiang (30°14'N., 122°14'E.), the narrow body of water W of Xiaochangtu Shan, is a deep water channel between Huang-ta Yang and Ch'u Chiang, and is navigable with caution by deep-drafted vessels. The sides of the channel are fronted by large areas of steep-to, drying mud flats which extend offshore from adjacent islands. The N and S entrances

are encumbered by scattered islets, shoal water, and several dangerous underwater rocks.

Directions.—Approaching Chu-Hsu Chiang from the S, steer to pass about 1 mile N of **Jiaobeishan** (30°11.0'N., 122°18.5'E.) and then midway between the islet **Wen-ch'ung Sham** (30°12.0'N., 122°14.8'E.) and a 4.9m patch lying 1 mile NNE of it. When the W extremity of **Dazhuxu** (30°17.3'N., 122°14.8'E.) is in line with a 6m high rock (30°14.4'N., 122°15.0'E.) close of SW point of Xiaochangtu Shan, bearing 353°, alter course NNW to pass W of **Bayliss Rock** (30°14.3'N., 122°14.8'E.). The summit of **Ta-yuan Shan** (30°13.7'N., 122°16.1'E.) must be kept open S of a 2m high rock lying NW of it until the E extremity of a 36m high islet (30°17.1'N., 122°15.4'E.) is open on the W side of Xiaochangtu Shan. After passing Bayliss Rock, steer to bring the E extremity of Dai Shan to bear 000° and just open W of the W extremity of Dazhuxu. When the summit of the 36m high islet bears 030° steer for it on that bearing until the W extremity of Wen-ch'ung Shan is just open W of the W extremity of Xiaochangtu Shan, bearing 184° then steer 062°. When the N sides of Dazhuxu and the 36m high islet are in line bearing 292°, alter course NNE and keep the NW extremity of Xiaochangtu Shan bearing 214° astern.

Vessels approaching the channel from the N follow these directions in the reverse order.

For the W entrance of Changtu Gang, enter the channel W of Dachangtu Shan as previously directed. When the 2m high rock (30°14.0'N., 122°15.3'E.) is abeam to the starboard, alter course ENE for the harbor entrance and pass 91 to 183m N of the rock. The navigable channel abreast this rock is only 0.15 mile wide. After passing the rock, bring it to bear 226°, astern, so as to pass 137m off a rocky point on the N shore, 0.75 mile NE. Then keep to the N shore, which is mud and steep-to, until clear of a rock, which dries 3m, lying close within the SE entrance point. Thereafter, a mid-channel course can be steered to the anchorage.

The E entrance to Changtu Gang lies close W of the bluff NW point of Dachangtu Shan and is difficult to identify. The entrance is about 0.3 mile wide with a least depth of 5.8m in the fairway. If approaching from the E, care must be taken that the N extremity of Duozi Shan does not bear less than 090° until W of the Hornets. To enter, keep close to the bluff NW point Dachangtu Shan and then maintain a mid-channel course to the harbor.

Great care and attention is required when negotiating the sharp bend around the SE corner of Xiaochangtu Shan, where the channel is only about 0.2 mile wide. Numerous fishing boats and nets will be encountered before reaching the anchorage.

6.13 Jiaobei Shan (30°11'N., 122°18'E.), 3 miles S of the W part of Dachangtu Shan, is a double rock 23m high, covered with grass on top. Tidal currents around the rocks are strong and variable and vessels should give it a berth of at least 0.5 mile. Hsiao-chiao-pei, 8m high, lies 0.5 mile WNW of Jiaobeishan. It has a gap in the middle which is prominent when seen from SE or NW.

A steep-to pinnacle rock, lying 1 mile NNE of Jiaobeishan, has a depth of 3.7m; another pinnacle rock, with a depth of

6.4m, lies 2 miles W of Jiaobeishan. Neither rock gives any visible indication of their existence.

Dai Shan (30°17'N., 122°10'E.), largest of the main group of islands on the N side of Huang-ta Yang, consists of two rugged and hilly islands which, rising from large surrounding areas of drying mud flats, have been joined together by heavily cultivated fields of reclaimed land to form a single island with an irregular, indented coastline.

Numerous islets and rocks lie scattered in all approaches. Yanwo Dao (Castle Rock), the outermost of several islets and rocks extending NNW from the N point of the island, is a high conspicuous rock. Tidal currents in the vicinity of this rock attain a rate of 4 to 6 knots at springs, causing whirlpools and eddies. It is advisable to give the rock a berth of at least 0.5 mile.

Dajiao Shan (30°13'N., 122°08'E.), lying centrally in the channels S of Dai Shan, consists of two hills, 72m and 105m high, connected by a low, narrow isthmus. Kuan Shan, 1 mile E, has a prominent dome shaped summit 182m high.

6.14 Kuanshan Chiang (30°13'N., 122°12'E.), a deep water navigable channel between Kuan Shan and **Xiu Shan** (30°10'N., 122°10'E.), is the preferred passage among several in the W access to Huang-ta Yang and is used by full-powered vessels as the most direct route to Chu-hsu Chiang. Several above and below-water dangers on the S side of the channel as well as strong currents and eddies that require caution in transiting. Kao-t'ing Chiang, a deep water, navigable channel W of Kuan Shan, is an encumbered passage leading to Daishan (Kao-t'ing-chen), a small community on the SE extremity of Tai Shan. Tidal currents in both Kao-t'ing Chiang and Kuanshan Chiang reach a maximum rate of 5 knots at neaps and 8 knots at springs.

Huoshan Liedao (30°20'N., 121°55'E.), a group of islets W of Dai Shan, constituting the W extremity of the islands and groups of islands N of Huang-ta Yang, consists of two larger islets joined by an extensive drying mud flat, and numerous smaller islets, isolated rocks, and underwater dangers.

Dayu Shan (30°19'N., 121°58'E.), the E island of the group, rises to a ridge with several well-defined peaks of similar height; the highest peak, 121m high, is at its N end. Xiaoyu Shan, 1 mile W of Dayu Shan, has a 123m high hill in its center; a chain of islets and rocks extends 2 miles NW to Dachen Shan, 57m high.

Yuxingnao (30°21'N., 121°52'E.), a black rock, 19m high, split in two and marked by a light, lies on the W end of the scattered dangers in the W part of Huoshan Liedao. Other dangers may best be seen on the chart.

Caution.—Fishing stakes may be encountered within 4 miles ENE of the N end of Dayu Shan and within 5 miles S of Yuxingnao.

6.15 Zhoushan Dao (30°05'N., 122°06'E.), the principal island in Chou-shan Ch'un-tao and the largest island of the several islands and numerous islets S of Huang-ta Yang, has a largely mountainous surface alternating with several well-cultivated coastal plains and an irregular, much-indented coastline of which the N and NE sections are fronted by

extensive areas of drying mud flats, large areas of shoal water, and numerous smaller islands, islets, and scattered offshore rocks.

Zhoushan Dao is emerging as a new offshore harbor area in SE China. Several berths has been constructed at various locations around the island.

Pilotage.—The vessel should send its ETA 72 hours, 48 hours, and 24 hours prior to arrival pilot station. Pilots board at the Xaizhi Men (Xia Si Men) anchorage (29° 43'N., 122° 21'E.) E of Hsia-Chih Jao. For large vessels, immigration clearance is carried out at an anchorage approximately 2.5 miles W of Ta-Ma I Tao in position 29°52'N., 122°12'E.

Dongting Shan (29°52'N., 122°35'E.) is a bare, rocky islet which, reported radar conspicuous at 22 miles, constitutes the farthest seaward danger in the approach to the S side of Huang-ta Yang. The islet, 49m high, is cleft in two from N to S and is bare and rocky except for some cultivated plots. A light is shown from the summit of the islet.

Zhujiajian (29°56'N., 122°23'E.), a mountainous island with large areas of drying mud flats and extensive areas of well-cultivated reclaimed land on its W sides, lies almost joined to the SE extremity of Zhoushan Dao. It is separated N from Putuo Shan, a smaller mountainous islet, by the deep water channel Lien-hua Yang. The coastline on the E side of the island is indented by many shoal bays fronted by several scattered islets and off-lying rocks.

Anchorage.—Small vessels obtain anchorage, during the Northeast Monsoon, within the entrance to Wolf Bay (Nan-sha Wan), the largest bay on the SE side of Zhujiajian.

Vessels anchor, in 21.9 to 25.6m, good holding ground, close off the S extremity of Putuo Shan, where the maximum rate of the tidal current is reported to be 3 knots at neaps.

6.16 Hulu Dao (30°02'N., 122°26'E.), 88m high, lies off the NE end of Putuo Shan, from which it is separated by a deep channel.

Huaping Shan (30°04'N., 122°29'E.) is a scattered group of four prominent and five smaller above water rocks surrounded by foul ground lying 2 miles ENE of Hula Dao. These rocks are steep-to and soundings give no warning of their proximity.

Wai-huo Hsu (30°04'N., 122°27'E.), a grass covered islet with a well-defined 46m summit, lies 1 mile WNW of Huaping Shan.

Lihuo Yu (30°06'N., 122°22'E.), 35m high, lies 6 miles WNW of Huaping Shan. A light is shown from the summit.

Vessels bound N for Chu-hsu Chiang pass close W of Wai-huo Hsu to clear the scattered underwater dangers fronting Putuo Shan, and usually pass NE of Lihuo Yu, although the passage SW is safe for vessels of any draft.

The channels among the several islets and rocks W of Lihuo Yu are not recommended.

The S side of the W access to Huang-ta Yang is obstructed by several islands having surrounding margins of drying mud flats. It is dotted by numerous islets and scattered underwater dangers which, lying close offshore, are separated from the N coast of Zhoushan Dao by a tortuous, intricate channel, not recommended without local knowledge of the many dangers and strong tidal currents.

Hangzhou Wan—Southeast Approach

6.17 The SE approaches to Hangzhou Wan are fronted by the larger island Chou-shan Tao and the remaining smaller, off-lying islands of the S portion of Chou-shan Ch'un-tao. The approaches are traversed by several deep water access channels which, leading from sea, pass through the smaller off-lying islands and, once inside, unite to form a broad channel trending W from the S entrance point of Hangzhou Wan, as well as branching N to pass W of Zhoushan Dao. The principal ports in the area are Dinghai and Zhenhai.

Chuanshan Bandao (29°53'N., 122°08'E.), the S entrance point of Hangzhou Wan, is the SE extremity of a long, mountainous promontory which terminates to the E, the generally low and flat S side of Hangzhou Wan.

Hangzhou Wan—Southeast Approach—Off-lying Islands and Deep Water Access Channels

6.18 The off-lying islands in the SE approaches to Hangzhou Wan extend about 20 miles NE-SW between Zhujiajian and Liuheng Dao, and consist of several large mountainous islands and a multitude of lesser islands, clustered islets, and scattered above and below-water dangers. Most of the islands rise from surrounding shoal water and have irregular, indented coastlines, extensive portions of which are fronted by large areas of drying mud flats and backed by well-cultivated areas of lowland. The water area forming the channels among the larger islands is deep.

Wu-sha Men (29°49'N., 122°22'E.), the N access channel, lies between Zhujiajian and Taohua Dao and trends NW before branching N into **Chu-chia Kang** (Fremantle Channel) (29°54'N., 122°24'E.) or WNW into **Che'ng-tzu Man** (Rambler Channel) (29°51'N., 122°17'E.). The latter channel is partially blocked at its E entrance by **Hsuan-po-ku Shan** (29°50'N., 122°19'E.) and several adjacent islets. At times, it is entirely obstructed by fishing nets. The passage between Hsuan-po-ku Shan and Taohua Dao is not recommended because of strong tidal currents.

Vessels enter Wu-sha Men either N or W of the steep-sided islet Wuzhu Shan, the farthest seaward danger in the entrance, and passing NE of the drying rock **Pan-ch'ao Yen** (29°48.4'N., 122°21.3'E.), shape a course so as to pass between Shou-hsien Yu, a small island close SW of Zhujiajian, and the low-lying Channel Rocks (Tung-chien Shih), located about 0.5 mile W. Then they enter Chu-chia Kang and steer a mid-channel course until reaching Tung-shan Tao, an islet N of the island Dengbu Dao. They clear the drying mud flats on the N side of the channel by keeping **Lujiazhi** (29°55'N., 122°18'E.), about 2.5 miles NW of Tung-shan Tao, on a heading of not less than 295°.

Tidal currents at the S entrance to the channel have a maximum rate of 3 knots.

Small vessels, seeking shelter from typhoon winds, can obtain anchorage, in 10.1m, in the channel N of Lujiazhi, however, the depths approaching the anchorage may be less than charted. Larger vessels can anchor about 1.3 miles SW of **Xiaogan Shan** (29°57'N., 122°14'E.). The holding ground is good, but the anchorage is unsheltered. Tidal currents are

sufficiently strong enough to prevent the ship swinging to the wind.

6.19 Hsia-chi Men (Shih-peng Chiang) (Vernon Channel) (29°46'N., 122°15'E.), the middle channel, lies between T'ao-hua Dao and Xiaqi Dao and trends NW from the clear E entrance for about 8 miles to the several islands and many scattered rocks obstructing the W entrance. The E entrance is reported radar conspicuous at 22 miles.

Tidal currents within the channel reach a maximum velocity of 5 knots at neaps and springs. Vessels can obtain anchorage, in 7.3m, in a large shoal bay on the NE side of Xiaqi Dao and also in 12.8m close S of Ta-shuang Shan, the highest of the several islands in the W entrance to the channel.

T'iao-chou Men (Beak Head Channel) (29°43'N., 122°16'E.), the SW access channel, lies between Xiaqi Dao and Liuheng Dao. Vessels transit the channel in deep water throughout by passing between Tsou-ma-t'ang and Ta-liang-t'ou, two smaller islands among a group of dangers about 4 miles inside the E entrance.

Vessels anchor, in 18.2m, NW of Chin-po-yu, an island surrounded by shoal water located about 2 miles NW of Tsou-ma-t'ang, or proceed to the W entrance. A NW current tends to set onto Hsi-ho-tsui (Ta-men Shan), the outermost danger on the E side of the entrance.

Vessels that transit Hobart Channel (Hsia-ma Men), the passage NE of Tsou-ma-t'ang leading to Hsia-chi Men, is not recommended without local knowledge. Vessels also anchor in appropriate depths, mud and sand, in Port Rouse (Mo-t'ou Kan), an anchorage off the SE coast of Liu-heng Tao convenient for awaiting tidal conditions in T'iao-chou Men.

Hangzhou Wan—Southeast Approach—Inside Channels and Harbors

6.20 Fo-to-kang-tao (Ch'i-t'ou Yang) (29°48'N., 122°04'E.) is the body of water lying between Liuheng Dao and Meishan Dao, a large, rather low and well-cultivated island which, rising from surrounding areas of drying mud flats, lies to the NW and separated from the mainland by a narrow, unnavigable channel.

Vessels anchor, in 23.7m, mud, midway between the entrance points of a bight formed on the N side of Liuheng Dao and in convenient depths, clear of fishing stakes, on the NW side of Fo-to-kang-tao, between Meishan Dao and **Ch'i-t'ou Chiao** (29°53'N., 122°08'E.), the W extremity of Chuanshan Bandao.

Luotou Shuidao (Pai-ya Yang) (29°55'N., 122°03'E.), the continuation W of the NE reaches of Fo-to-kang-tou, is largely encumbered N by the numerous islands and dangers fronting the S coast of Zhoushan Dao and narrowed to a deep, clear channel about 1 mile wide in its W part by the outermost island fronting Zhoushan Dao and by the islands and dangers lying off the mainland coast.

Hsiao-yang-mo-Yu (Roundabout Island) (29°54'N., 122°09'E.), 1 mile E of the extremity of Chuanshan Bandao, is steep, rocky, and has a grass covered round summit, marked by a light, 37m high. The passage inshore of the island is deep, but has heavy tide rips and strong eddies. It should not be attempted by vessels unable to maintain a speed of 10 knots

against the spring tidal current. Tidal currents near the island vary from 2 to 6 knots.

Cezi Shuidao (T'se-tzu Shu-tao) (Bell Channel) (30°00'N., 121°57'E.), the continuation N of Luotuo Shuidao, lies between the drying mud flats fronting the SW coast of Zhoushan Dao and the largely mountainous off-lying island of Chin-t'ang Shan, and trends N as far as the island of **Cezi Shan** (30°06'N., 121°56'E.), where it divides into an E and W branch. The E branch, is free of tide rips and has its better passage E of the mid-lying islet Ku-tz'u Shan, the W passage being recommended with local knowledge only. Xihou (Hsi-hou) Men, the W branch, is wide and generally deep but has a rocky, uneven bottom. Vessels proceed through Cezi Shuidao on a track passing midway between Jintang Shan and **Banyang Jiao** (Pan-yang Chino) (30°01'N., 121°58'E.), a steep-to islet lying near the center of the S entrance.

Anchorage.—Vessels anchor on the E side of Cezi Shuidao in convenient depths and out of strong tidal currents anywhere within 1 mile of the mud flats extending off Zhoushan Dao, and on the W side of the channel, in 14.6 to 18m, in a position sheltered from currents with the W extremity of Cezi Shan not yet open E of the NW extremity of Jintang Shan. They moor in 16 to 27m in the S entrance of Xihou Men, with **Lao-hu Shan** (30°04'N., 121°55'E.), an islet off the SW extremity of Czi Shan, in line bearing 274° with the 281m summit in the N part of Jintang Shan.

6.21 Jintang Shuidao (29°57'N., 121°52'E.) is entered between the SE point of Jintang Shan, and the N point marked by a light, of Daxie Dao, about 3 miles SE. The passage is the westward continuation of Luotou Shuidao. It lies between the S shore of Jintang Shan and the drying mud flats fronting the mainland coast, and leads W into the approaches to the river Yung Chiang and N into the deep water area along the W side of Jintang Shan. It is deep and, in general, clear except for **Huangniu Jiao** (29°58'N., 121°54'E.), a black, steep-to, above-water rock lying near the middle of the E entrance, and **Dahuangmang** (29°59'N., 121°48'E.), a steep-sided islet with several adjacent dangers lying on the S side of the W entrance. Both islets are marked by lights.

Beilun Ore Terminal (29°56'N., 121°53'E.), situated on the S side of Jintang Shuidao, has been built for deep draft vessels to partially unload before proceeding to Chang Jiang estuary. An F-shaped pier provides at its head berths 351m and 500m long, with depths of 18m and 12m, to accommodate one 100,000 ton and two 25,000 ton ore carriers.

Beilun Oil Terminal (29°57'N., 121°49'E.), situated 4 miles W of Beilun Ore Terminal, has a T-shaped pier with a berth 612m long at its head, and a depth alongside of 11m.

The terminal can accommodate one 150,000 dwt and two 25,000 dwt tankers. The VLCC Beilun is anchored about 1 mile off the terminal, and is used for storing crude oil and other products delivered by smaller tankers from on-shore oilfields.

Beilun Port, the new harbor area of Ningbo, is undergoing development as a major deep water port for handling bulk oil, ore, timber, container, and general cargo.

Coal container and multi-purpose berths can accommodate vessels of 50,000 dwt; general cargo berths can accommodate vessels up to 25,000 dwt. New berths has been constructed to handle timber, bulk ore, and general cargo.

It has been reported that vessels bound for these terminals should proceed from position 30°10.2'N., 123°03.3'E., steering 218° to position 29°45.0'N., 122°40.6'E., then steer 270° to the pilot anchorage, bounded by latitudes 29°44'N., and 29°46'N., and longitudes 122°20.5'E., and 122°22.5'E.

It was reported that the tidal currents set strongly through this anchorage in a NE and SE direction.

There vessels should anchor and await a pilot.

The ETA at the pilot anchorage should be sent 1 hour before arrival on VHF channel 16. A listening watch should be maintained on that channel until the pilot has boarded.

Daxie Dao (29°55'N., 121°58'E.) is a large, hilly island with cultivated plains protected by reclamation walls. Its SE part rises to a double peak, 333m and 329m high. A narrow passage separates the island from the mainland to the S. The E part is encumbered with islets, rocks, and fishing nets and should not be attempted.

Between Dapeng Shan (30°04'N., 121°50'E.) and Jantang Shan (Chin-t'ang) lies a narrow channel convenient for typhoon refuge. Small vessels, with a draft not greater than 4.9m, moor in convenient depths where they may experience a surge due to strong eddies created during spring tides.

6.22 Dinghai (Ting-hai) (30°00'N., 122°06'E.) ([World Port Index No. 59960](#)), about 8 miles NNW of the S entrance point of Hangzhou Wan, is a small harbor and naval station on the S coast of Zhoushan Dao. It is fronted by numerous hilly islands, rugged islets, and scattered above and below-water rocks which rise abruptly from generally deep water. Access to the harbor is reduced to two approaches. Ma-ch'in Shui-to, the W approach, is the recommended approach for large, deep-drafted vessels. Melville Channel, the S and most direct approach, is not recommended for large or low-powered vessels because strong currents at times form dangerous eddies, especially around the several underwater dangers in the N part of the channel.

Anchorage.—There is good anchorage, in depths of 20 to 22m, towards the E side of the main channel of the W approach route, about 1 mile NNE of Damao Shan. In this position the tidal currents are not strong and run more regularly than in mid-channel.

Anchorage can be obtained between **Nab Rock** (30°00'N., 122°04'E.), with a depth of 3m, and Chu Shan, an island lying 0.5 mile ESE of Nab Rock, in depths of 29 to 31m, but is not recommended as the tidal currents and eddies are strong.

The outer anchorage, situated NE of the N end of Melville Channel, affords anchorage to large vessels in a depth of 22m, with **Cap Rock** (29°59'N., 122°05'E.), 5m high, in line with the NW side of **Sa-a Tao** (29°59'N., 122°06'E.), bearing 228°, and **Lao-shu Chiao** (30°00'N., 122°06'E.) bearing 332°. In this position the tidal currents are fairly steady and there are few eddies, but to the W of the anchorage the bottom is very uneven and heavy swirls and eddies occur.

The inner anchorage affords anchorage, in a depth of 11m, with Lao-shu Chiao bearing 130°, 0.4 mile distant.

This is the best anchorage, although encumbered by junks, they usually anchor on the W side of Middle Ground. The tidal current and eddies are very strong here.

Directions.—Enter Melville Channel midway between Zhairuo Shan and Pi-chia Shan, 1 mile E, and steer to pass

close E of Yen Tao. Then bring the E side of Yen Tao into line with Trunk Point, the E extremity of Zhairuo Shan, bearing 184° astern. This alignment leads between Black Rock, 0.6m high, and a drying ledge to the E and between Melville Rock, with a depth of 2.7m and Dundas Rock, with a depth of 1.8m to the E. When clear of the two islands NE of Dundas Rock, course can be set for the inner or outer anchorage at Dinghai as required.

When using Ta-chu Shui-tao, which branches NE from Melville Channel, favor the E shore to avoid Melville Rock and the mudflat fringing the two islands NNE of it.

There is no range mark for clearing **Elliot Patch** (29°58.9'N., 122°06.3'E.), which has a least depth of 5.4m, but the channel SE is wider and deeper than that NW.

Yeh-chu Chiao, a drying rock, can be passed on either side but caution must be used to avoid a 2.7m patch that lies 183m further NE.

Tidal currents in the middle of Melville Channel attain a rate of 3 to 5 knots. It is preferable to enter this channel with a N tidal current.

The channel leading SW past Cap Rock should not be used, as there are dangers at each end and the tidal currents in it attain a rate of 3 to 5 knots.

Ma-Ma-ch'in Shui-tao the safest and best route for large, deep draft vessels passes between Damao Shan and Hsieh Hsu 0.75 mile N. This deep, clear route leads to the outer anchorage. Local vessels enter by using Lo-tou Meng, NW of Hsieh Hsu, but this passage should not be attempted without local knowledge as a vessel may be set onto dangers by strong tidal eddies.

Tidal currents in Ms-Ma-ch'in Shui-tao attain a maximum rate of 2 to 3 knots. While those in Lo-tou meng attain a rate of 2 to 5 knots.

6.23 Zhenhai (Chen-hai) (29°57'N., 121°42'E.) ([World Port Index No. 59950](#)), about 22 miles WNW of the S entrance point of Hangzhou Wan, is a small river port located, principally, on the W side of the entrance to the river Yong Jiang. Several off-lying, steep-sided islets, with adjacent dangerous underwater rocks, lie in the approaches while extensive areas of drying mud flats flank the entrance to the river and the mud bars which obstruct it.

Depths are subject to constant change. The W entrance point of the river is a precipitous hillock surmounted by two large temples. The E side of the river entrance is largely low land alternately with hilly ridges.

Tides—Currents.—Tidal currents in the river off Zhenhai attain rates of 1 knot at neaps and 3 knots at springs. After heavy rains inland, the ebb current often runs for 12 hours, and vessels do not swing to the flood current at all.

Strong winds between N and NE usually raise the water level about 0.5m above normal. From December to March, the water level is usually about 0.5m lower than in the months of August and September.

Depths—Limitations.—There are five berths for 10,000 ton bulk carriers/general cargo, one berth for 10,000 ton tankers, and one berth for liquid chemical tankers. An overhead power cable, with a minimum vertical clearance of 44m, is between Zhaebeo Shan and Jingi Shan.

Pilotage.—Vessels upon prior arrangements with the harbor master at Ning-po, usually board pilots NE of **Dayoushan** (Wai-yu Shan) (29°59'N., 121°45'E.), two precipitous islets on the E margin of a drying mud flat lying about 1 mile ENE of the W entrance point of the river. They cross the bar and enter the river with a maximum draft of 6.1m at high water springs and 5.6m at high water neaps.

A breakwater extends 0.275 mile E from Dayoushan, with a light shown on its head.

Xialaotaipo Jiao, drying 1.2m, lies 0.175 mile ENE of Dayoushan.

Anchorage.—Anchorage can be obtained, in a depth of 9.1m, at the NE end of a deep water pool SE of Zhenhai, but it is necessary to moor. The quarantine anchorage, also used by vessels with dangerous cargo, is situated on the N side of the channel, about 1 mile further upriver.

Directions.—The N part of this route passes through an area that has a number of stranded wrecks and shoal soundings which can best be seen on the chart.

To avoid the shallower to the W, pass about 0.4 mile W of Dapeng Shan and Kan-ch'ih, a small islet NW of it. Steer a course S until the SE side of Waiyoushan comes into line with two large temples on Zhaebeo Shan 1.5 miles further SW. Then steer SW for the pilotage-quarantine anchorage.

To use the E approach, pass 0.5 mile S of **Huangnic Jiao** (29°58'N., 121°54'E.) and the same distance S of a beacon close S of the S extremity of Ganchi Shan. Then pass 0.5 mile N of E Jiao and steer W for the pilotage-quarantine anchorage.

Ningbo (29°53'N., 121°33'E.)

[World Port Index No. 59940](#)

6.24 Ningbo (Ning-po), about 30 miles W of the S entrance point of Hangzhou Wan, is a large metropolis situated about 12 miles up Yong Chiang and stands at the confluence part of Chekiang Province.

Tides—Currents.—The tidal currents at Ningbo have a maximum rate of 2 knots on the flood current and 2 to 3 knots on the ebb current.

Depths—Limitations.—Ningbo has three coal piers, one for 30,000 dwt vessels and two for 10,000 dwt vessels. Two additional 10,000 dwt coal piers are under construction and so are facilities for 100,000, 50,000, and 10,000 dwt ships.

Presently, there are seven berths to accommodate vessels of 3,000 dwt. These facilities extend along the W bank of Yong Jiang for about 1 mile downstream from the city, with a total frontage of 1,194m and alongside depths of 3.7 to 7.3m. The maximum berth length is 108m.

A 110m vessel, with a 5.5m draft, can enter and leave the port with a flood tide. Along the channels there are excellent aids to navigation. During the flood and ebb currents, there is a strong set on to concave banks in the winding areas of the channel. Vessels should not pass too close to the banks.

Pilotage.—Pilotage is compulsory for vessels entering and leaving the port. Pilots board vessels at the pilotage-quarantine anchorage.

Regulations.—A VTS is in operation to help monitor and control traffic.

Anchorage.—The pilotage-quarantine anchorage, with depths of 5 to 12m, sand, lies approximately 1.5 miles NE of **Qilizhi Shan** (30°00.0'N., 121°45.6'E.). A tanker anchorage, with depths of 14.4 to 21.5m, mud, has been established approximately 3 miles ENE of Qilizhi Shan.

Vessels up to 98m long moor, in 6.4 to 9.2m, in one of four mid-channel berths spaced within the lower harbor limits. With a swinging room of only about 182m available in the berths, vessels ride with four shots of chain on the upriver anchor and with three shots of chain on the down river anchor. Vessels longer than 92m must use their engines when swinging to the tide.

Hangzhou Wan—South Approach—Ch'i-t'ou Chiao to T'ung-t'ou Shan

6.25 The coastline between Ch'i-t'ou Chiao and T'ung-t'ou Shan, about 39 miles SSW, is extremely irregular and indented by coves and bays, which throughout are largely fronted by extensive areas of drying mud flats. Inland, mountains predominate and reach the shore in bluff headlands with cultivated marginal plains intervening.

Close offshore, numerous islands and islets lie scattered in water which, often discolored by mud, contains many hidden sunken dangers. Farther offshore, the many islands and islets lie grouped, in general, to the E of the seaway channel Niubishan Shuidao where they shelter the approaches to the SW entrance to Fu-to-kang-tao and the extensive inlet Xiangshan Gang.

Niubishan Shuidao (29°37'N., 122°06'E.) is a broad, open-sea fairway which leads N to the inside passage W of the islands fronting Hangzhou Wan and W to the entrance to Xiangshan Gang. During the winter months when N winds predominate and typhoons seldom occur, vessels with a draft not greater than 6.1m transit the deeper parts of the fairway. When typhoons occur in the offing, an E swell sets in which occasionally rises about 2.4m above mean sea level. At such times, vessels with a draft greater than 4.9m are not recommended to transit the fairway.

Jiushan Liedao (Chiu-shan Lieh-tao) (29°26'N., 122°12'E.), consisting of a group of high, steep-sided islands and islets, constitutes the principal danger on the E side of Niubishan Shuidao. Nanjiu Shan, the largest island of the group, is inhabited. A light is situated on the E extremity of Nanjiu Shan. **Daqing Shan** (Chit-kuk) (29°27'N., 122°15'E.), the E islet of the group, has a sharp summit conspicuous from the E.

Anchorage.—Anchorage, sheltered from SW winds, lies off the E side of **Shuang Shan** (29°27'N., 122°12'E.), in depths of 10 to 16m, mud and sand.

Shelter from W to N winds can be obtained in depths of 7 to 10m, mud, S of the E part of Nanjiu Shan. Off the E side of **Wenchong Shan** (29°24'N., 122°10'E.), shelter from N winds can be obtained in depths of 8 to 10m, mud.

Anchorage sheltered from NE and SW winds can be obtained about 1 mile SW of **Guanchuanao** (29°27'N., 122°11'E.), in depths of 6 to 9m, mud.

Vessels are cautioned that depths of 1.9m less than those charted are reported to exist in an area between limits extending 3 miles NE and NW from **Tung-hsu Shan** (29°37'N., 122°02'E.).

6.26 The entrance to **Fo-to-kang-tao** (Ch'i-t'ou Yang) (29°48'N., 122°04'E.), lying between Liuheng Dao and Meishan Dao, about 2 miles NW, has several channels leading through the many islands and scattered rocks that encumber free access.

Fodu Dao (Fo-tu Shan) (29°44'N., 122°01'E.), a hilly, irregularly shaped island rising from a surrounding margin of drying mud flats, lies separated from Liuheng Dao by Shuang-hsu Chiang, the E and widest but most encumbered channel leading to Fo-to-kang-tao. Ting-tzu Shan lies between Meishan Dao and Fodu Dao. Ting-tzu Chiang, the narrow and deep passage between Ting-tzu Shan and Meishan Dao, is not recommended because the drying mud flats rising steep-to off Meishan Dao offer little indication of their presence, especially when covered during high water. Gough Pass (Ching-lung Men), the deep and clear passage between Ting-tzu Shan and Fodu Dao, is the recommended channel leading to Fo-to-kang-tao. Tidal currents reach a maximum velocity of 3 knots at neaps and 5 knots at springs.

6.27 Xiangshan Gang (Hsiang-shan Chiang) (29°38'N., 121°48'E.) is an extensive inlet entered between **Chi Chiao** (Pearl Rock) (29°39.7'N., 121°54.3'E.) and **Huang-nui Chiao** (Sail Rock) (29°42'N., 121°52'E.), an above-water rock standing about 4 miles NW and near the outer edge of a drying mud flat extending seaward from the shore. The sound extends about 25 miles SW and has a very irregular shoreline much indented by inlets and large bays, the greater portion of which are filled with drying mud flats. The seaward half is deep and largely clear. The inner half is much encumbered by off-lying islets and extensive areas of drying mud flats. The sound offers well-sheltered anchorage during the typhoon season.

Tides—Currents.—The tidal currents in Xiangshan Gang have a maximum rate at springs of 3 knots in the entrance and 4 knots in the inner part of the inlet.

Anchorage.—Anchorage can be obtained near the entrance to Xiangshan Gang in a position 2 miles WSW of Pearl Rock, in depths of 6.4 to 8.2m.

Well-sheltered typhoon anchorage can be obtained about 1 mile WSW of the S point of **Entrance Island** (29°32'N., 121°40'E.), in a depth of 9.1m. There is also good holding ground about 1 mile S of the W extremity of **Harlequin Island** (29°32'N., 121°34'E.), in depths of 8.2 to 11.9m.

Small vessels with local knowledge can obtain good anchorage, in a depth of about 9.1m, out of the strength of the tidal currents, between the **Pa Za Islets** (29°30'N., 121°36'E.) and the S shore of Xiangshan Gang.